Dept. of Energy National Nuclear Security Administration (NNSA) Advanced Simulation and Computing (ASCI) Presentation at

SC02 Birds-of-a-Feather Federal Funding for HEC

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An interesting quote...

"... this problem of making a large memory available at reasonably short notice [time] is much more important than that of doing operations such as multiplication at high speed. Speed is necessary if the machine is to work fast enough for the machine to be commercially viable, but a large storage is necessary if it is to be capable of anything more than rather trivial operations."

Alan Turing1947

November in Sonoma

- Open source software
  - Open source systems software for DOE/NNSA
  - NNSA/DOE national labs
  - NNSA and DOE headquarters personnel
  - Open Source and HPC vendors
- ASCI Simulation and Computer Science Roadmaps
  - NNSA labs
  - Identify critical CS technologies that may be potential impediments to our ability to meet ASCI mission needs

Simulation and Computer Science Roadmaps

- Simulation Development Environment Tools
- Problem Set up
- Scalable Solvers
- Data Storage and File System
- Scientific Data Management
- Visualization
- Connectivity
- Computer System Infrastructure

Possible Open Source Software Activities

- Linux Distribution that supports HPC
  - Working with vendors to explore this
- BIOS/BProc
  - Linux BIOS
- Light weight computational kernel
- Lustre filesystem
  - Currently being funded
- Fortran
  - F95/F2000
  - Legacy codes
  - Portability

Many, many more…

ASCI PF Investments

- Interconnects:
  - Optical switch (with NSA)
- Storage:
  - LOTS Technology
- System Tools & Software:
  - Etnus, KAI/Pallas, MSTI
  - HP/CFS object storage file system
  - IBM file system
- Visualization:
  - HP Scalable Rendering
  - Red Hat

ASCI External HPC Activities

- Actively participated in national security agencies NSA chaired study
  - Support the IHEC study results
- Active participation in DARPA HPCS program
  - Exploring future high-productivity architectures that may be of interest to ASCI
- Jointly funding with DOE Office of Science
  - National Academy of Science study on supercomputing
  - Open source systems software